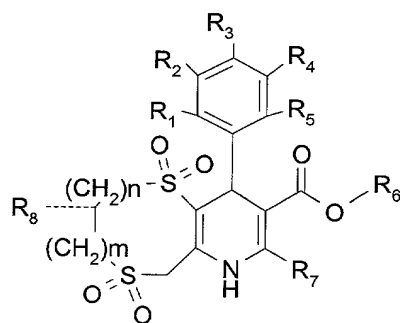


What is claimed is:

1. A compound of Formula I,



Formula I

5

or a pharmaceutically acceptable salt thereof, wherein

- (a)  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$  and  $R_5$  are independently selected from the group consisting of H, OH, halogen, cyano,  $\text{NO}_2$ , alkyl,  $\text{C}_{1-8}$  alkoxy,  $\text{C}_{1-8}$  alkylsulfonyl,  $\text{C}_{1-4}$  carboalkoxy,  $\text{C}_{1-8}$  alkylthio, difluoromethoxy, difluoromethylthio, trifluoromethyl, and oxadiazole (formed by  $R_1$  and  $R_2$ );

10

- (b)  $R_6$  is selected from the group consisting of H,  $\text{C}_{1-5}$  straight or branched alkyl, aryl, 3-piperidyl, N-substituted 3-piperidyl, N-substituted 2-pyrrolidinyl methylene, and substituted alkyl, wherein

15

said N-substituted 3-piperidyl and said N-substituted 2-pyrrolidinyl methylene may be substituted with  $\text{C}_{1-8}$  straight or branched chain alkyl or benzyl, and said substituted alkyl may be substituted with  $\text{C}_{1-8}$  alkoxy,  $\text{C}_{2-8}$  alkanoyloxy, phenylacetyloxy, benzoyloxy, hydroxy, halogen, p-tosyloxy, mesyloxy, amino, carboalkoxy or  $\text{NR}'\text{R}''$ , wherein

20

- (i)  $R'$  and  $R''$  are independently selected from the group consisting of H,  $\text{C}_{1-8}$  straight or branched alkyl,  $\text{C}_{3-7}$  cycloalkyl,

25

phenyl, benzyl, and phenethyl, or (ii) R' and R" together form a heterocyclic ring selected from the group consisting of piperidino, pyrrolidino, morpholino, thiomorpholino, piperazino, 2-thieno, 3-thieno, and an N-substituted derivative of said heterocyclic rings, said N-substituted derivative being substituted with H, C<sub>1-8</sub> straight or branched alkyl, benzyl, benzhydryl, phenyl and/or substituted phenyl (substituted with NO<sub>2</sub>, halogen, C<sub>1-8</sub> straight or branched chain alkyl, C<sub>1-8</sub> alkoxy and/or trifluoromethyl);

- (c) R<sub>7</sub> is selected from the group consisting of H, amino, alkyl, aryl, trifluoromethyl, alkoxymethyl, 2-thieno and 3-thieno;
- (d) R<sub>8</sub> is connected to the bis-sulfone ring via a single or double bond, as applicable, and is selected from the group consisting of H, alkylhydroxy, alkenyl, amino, phenyl, benzyl, C<sub>1-8</sub> straight or branched alkyl, trifluoromethyl, alkoxymethyl, C<sub>3-7</sub> cycloalkyl, substituted benzyl, formyl, acetyl, t-butyloxy carbonyl, propionyl, substituted alkyl and R'''CH<sub>2</sub>C=O, wherein (i) said substituted benzyl is substituted with halogen, trifluoromethyl, C<sub>1-8</sub> straight and/or branched alkyl or C<sub>1-8</sub> alkoxy, (ii) said substituted alkyl is substituted with amino, dialkyl amino, C<sub>1-8</sub> alkoxy, hydroxy and/or halogen, and (iii) R''' is amino, dialkyl amino, C<sub>1-8</sub> alkoxy, hydroxy or halogen; and
- (e) m, n, and their sum are each an integer from 0 to 4.

2. The compound of Claim 1, wherein R<sub>6</sub> is -(CH<sub>2</sub>)<sub>2</sub>N(CH<sub>3</sub>)CH<sub>2</sub>PH.

3. The compound of Claim 1, wherein R<sub>6</sub> is methyl.

4. The compound of Claim 3, wherein R<sub>4</sub> is CF<sub>3</sub>, R<sub>5</sub> is F, R<sub>7</sub> is methyl, R<sub>8</sub> is methylene, m is 0 and n is 1.

5. The compound of Claim 3, wherein  $R_4$  is  $CF_3$ ,  $R_5$  is F,  $R_7$  is methyl,  $R_8$  is alkylhydroxy,  $m$  is 0 and  $n$  is 1.
- 5 6. The compound of Claim 1, wherein  $R_7$  is methyl.
7. The compound of Claim 6, wherein  $R_6$  is  $-(CH_2)_2N(CH_3)CH_2PH$ .
8. The compound of Claim 6, wherein  $R_4$  is  $CF_3$  and  $R_5$  is F.
- 10 9. The compound of Claim 6, wherein  $R_5$  is Cl.
10. The compound of Claim 6 wherein  $R_1$  is F and  $R_5$  is Cl.
- 15 11. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 20 12. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 2,3,6,9-tetrahydro-7-methyl-9-(3,4,5-trifluorophenyl)-2-[methyl(2-thienylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 25 13. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-[2-fluoro-6-(trifluoromethyl)phenyl]-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 30 14. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide, (9R).

15. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide, (9*S*).

5

16. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-hydroxyphenyl)-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.

- 10 17. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chlorophenyl)-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.

- 15 18. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-[2-fluoro-3-(trifluoromethyl)phenyl]-2,3,6,9-tetrahydro-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.

- 20 19. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 2,3,6,9-tetrahydro-7-methyl-9-(3-nitrophenyl)-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.

- 25 20. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 2,3,6,9-tetrahydro-7-methyl-9-(3,4,5-trifluorophenyl)-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.

- 30 21. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-methyl ester 1,1,4,4-tetraoxide.

22. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-5-nitrophenyl)-2,3,6,9-tetrahydro-7-methyl-methyl ester 1,1,4,4-tetraoxide.



31. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-[2-fluoro-3-(trifluoromethyl)phenyl]-2,3,6,9-tetrahydro-7-methyl-3-methylene-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 5
32. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-[2-fluoro-3-(trifluoromethyl)phenyl]-2,3,6,9-tetrahydro-3-(hydroxymethyl)-7-methyl-methyl ester 1,1,4,4-tetraoxide.
- 10
33. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-[2-fluoro-3-(trifluoromethyl)phenyl]-2,3,6,9-tetrahydro-3-(hydroxymethyl)-7-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 15
34. The compound of Claim 1 which is: 5*H*-1,4-Dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 2,3,6,9-tetrahydro-3-(hydroxymethyl)-7-methyl-9-(3-nitrophenyl)-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,4,4-tetraoxide.
- 20
35. The compound of Claim 1 which is: 2*H*,6*H*-1,5-Dithiocino[3,2-*b*]pyridine-9-carboxylic acid, 3,4,7,10-tetrahydro-8-methyl-10-(3-nitrophenyl)-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,5,5-tetraoxide.
- 25
36. The compound of Claim 1 which is: 2*H*,6*H*-1,5-Dithiocino[3,2-*b*]pyridine-9-carboxylic acid, 10-[2-fluoro-6-(trifluoromethyl)phenyl]-3,4,7,10-tetrahydro-8-methyl-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,5,5-tetraoxide.
- 30
37. The compound of Claim 1 which is: 2*H*,6*H*-1,5-Dithiocino[3,2-*b*]pyridine-9-carboxylic acid, 3,4,7,10-tetrahydro-8-methyl-10-(pentafluorophenyl)-2-[methyl(phenylmethyl)amino]ethyl ester 1,1,5,5-tetraoxide.

- 5



48

(a)  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$  and  $R_5$  are independently selected from the group consisting of H, OH, halogen, cyano,  $\text{NO}_2$ , alkyl,  $\text{C}_{1-8}$  alkoxy,  $\text{C}_{1-8}$  alkylsulfonyl,  $\text{C}_{1-4}$  carboalkoxy,  $\text{C}_{1-8}$  alkylthio, difluoromethoxy, difluoromethylthio, trifluoromethyl, and oxadiazole (formed by  $R_1$  and  $R_2$ );

(b)  $R_7$  is selected from the group consisting of H, amino, alkyl, aryl, trifluoromethyl, alkoxymethyl, 2-thieno and 3-thieno;

(c)  $R_8$  is connected to the bis-sulfone ring via a single or double bond, as applicable, and is selected from the group consisting of H, alkylhydroxy, alkenyl, amino, phenyl, benzyl,  $\text{C}_{1-8}$  straight or branched alkyl, trifluoromethyl, alkoxymethyl,  $\text{C}_{3-7}$  cycloalkyl, substituted benzyl, formyl, acetyl, t-butyloxy carbonyl, propionyl, substituted alkyl and  $\text{R}'''\text{CH}_2\text{C}=\text{O}$ , wherein (i) said substituted benzyl is substituted with halogen, trifluoromethyl,  $\text{C}_{1-8}$  straight and/or branched alkyl or  $\text{C}_{1-8}$  alkoxy, (ii) said substituted alkyl is substituted with amino, dialkyl amino,  $\text{C}_{1-8}$  alkoxy, hydroxy and/or halogen, and (iii)  $\text{R}'''$  is amino, dialkyl amino,  $\text{C}_{1-8}$  alkoxy, hydroxy or halogen;

(d)  $R_9$  is selected from -alkyl-OH, alkylamine, lactone, cyclic carbonate, alkyl-substituted cyclic carbonate, aryl-substituted cyclic carbonate,  $-\text{aryl}-\text{C}(\text{O})\text{OR}'$ ,  $-\text{alkyl-aryl}-\text{C}(\text{O})\text{OR}'$ ,  $-\text{alkyl}-\text{OC}(\text{O})\text{R}'$ ,  $-\text{alkyl}-\text{C}(\text{O})\text{R}'$ ,  $-\text{alkyl}-\text{C}(\text{O})\text{OR}'$ ,  $-\text{alkyl}-\text{N}(\text{R}'')\text{C}(\text{O})\text{R}'$ , and  $-\text{alkyl}-\text{N}(\text{R}'')\text{C}(\text{O})\text{OR}'$ , wherein

$\text{R}^{\text{I}}$  and  $\text{R}^{\text{II}}$  are independently selected from the group consisting of hydrogen, amino, alkyl, aryl, aryl-fused cycloalkyl, and heterocyclyl, the amino, alkyl, aryl, aryl-fused cycloalkyl, and heterocyclyl being optionally substituted with halogen, cyano,  $\text{NO}_2$ , lactone, amino, alkylamino, aryl-substituted alkylamino,



amide, carbamate, carbamoyl, cyclic carbonate, alkyl, halogen-substituted alkyl, arylalkyl, alkoxy, heterocyclyl and/or aryl (the aryl being optionally substituted with OH, halogen, cyano, NO<sub>2</sub>, alkyl, amino, dimethylamino, alkoxy, alkylsulfonyl, C<sub>1-4</sub> carboalkoxy, alkylthio and/or trifluoromethyl);

(e) m, n, and their sum are each an integer from 0 to 4; and

(f) p is an integer from 0 to 4.

44. The compound of Claim 43, wherein R<sub>9</sub> is -aryl-alkyl-OC(O)R'.

45. The compound of Claim 43, wherein R<sub>9</sub> is -alkyl-N(R'')C(O)R'.

46. The compound of Claim 45 which is: 5*H*-[1,4]dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-, 2-[[[(1,1-dimethylethoxy)carbonyl]amino]ethyl ester, 1,1,4,4-tetraoxide.

47. The compound of Claim 43, wherein R<sub>9</sub> is -alkyl-OC(O)R'.

48. The compound of Claim 47 which is: 5*H*-[1,4]dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-, 2-[[[(1,2,3,4-tetrahydro-2-naphthalenyl)carbonyl]oxy]ethyl ester, 1,1,4,4-tetraoxide.

49. The compound of Claim 47 which is: 5*H*-[1,4]dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-, 2-[(cycloheptylcarbonyl)oxy]ethyl ester, 1,1,4,4-tetraoxide.

50. The compound of Claim 47 which is: 5*H*-[1,4]dithiepine[6,5-*b*]pyridine-8-carboxylic acid, 9-(2-chloro-6-fluorophenyl)-2,3,6,9-tetrahydro-7-methyl-, 2-[[4-(1-methylethoxy)benzoyl]oxy]ethyl ester, 1,1,4,4-tetraoxide.

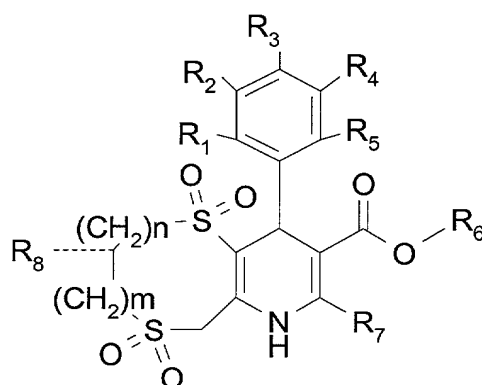
51. The compound of Claim 47 which is: 5*H*-[1,4]dithiepino[6,5-*b*]pyridine-8-carboxylic acid, 9-(2,3-dichlorophenyl)-2,3,6,9-tetrahydro-7-methyl-, 2-(2-methyl-1-oxopropoxy)ethyl ester, 1,1,4,4-tetraoxide.
52. The compound of Claim 47 which is: 2*H*,6*H*-[1,5]dithiocino[3,2-*b*]pyridine-9-carboxylic acid, 10-(2-chloro-6-fluorophenyl)-3,4,7,10-tetrahydro-8-methyl-, 2-[[4-(1-methylethoxy)benzoyl]oxy]ethyl ester, 1,1,5,5-tetraoxide.
53. A pharmaceutical composition comprising the compound of Claim 1 or 43 and a pharmaceutically acceptable carrier.
54. A method of treating a subject suffering from a disorder whose alleviation is mediated by the reduction of calcium ion influx into cells whose actions contribute to the disorder, which method comprises administering to the subject a therapeutically effective dose of the pharmaceutical composition of Claim 53.
55. A method of inhibiting in a subject the onset of a disorder whose alleviation is mediated by the reduction of calcium ion influx into cells whose actions contribute to the disorder, which method comprises administering to the subject a prophylactically effective dose of the pharmaceutical composition of Claim 53.
56. The method of Claim 54 or 55, wherein the disorder is selected from the group consisting of hypersensitivity, allergy, asthma, bronchospasm, dysmenorrhea, esophageal spasm, glaucoma, premature labor, a urinary tract disorder, a gastrointestinal motility disorder and a cardiovascular disorder.
57. The method of Claim 56, wherein the disorder is asthma.

58. The method of Claim 56, wherein the cardiovascular disorder is selected from the group consisting of hypertension, ischemia, angina, congestive heart failure, myocardial infarction and stroke.

5 59. An apparatus for administering to a subject the pharmaceutical composition of Claim 53, comprising a container and the pharmaceutical composition therein, whereby the container has a means for delivering to the subject a therapeutic and/or prophylactic dose of the pharmaceutical composition.

10

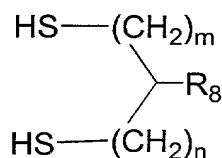
60. A process for preparing the compound of Claim 1



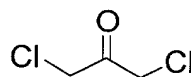
wherein m, n, and their sum are each an integer from 1 to 4, which process comprises the steps of

15

(a) reacting the compound of Formula 1a with the compound of Formula 1b



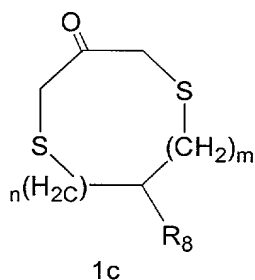
1a



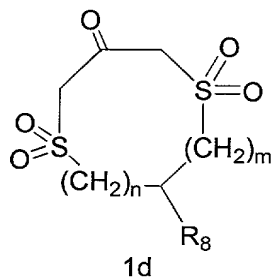
1b

20

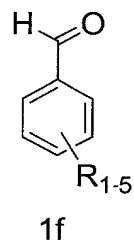
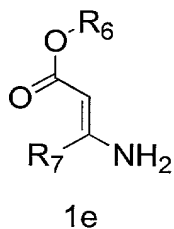
to form the compound of Formula 1c;



- (b) reacting the compound of Formula 1c with m-chloroperoxybenzoic acid to form the compound of Formula 1d;  
and



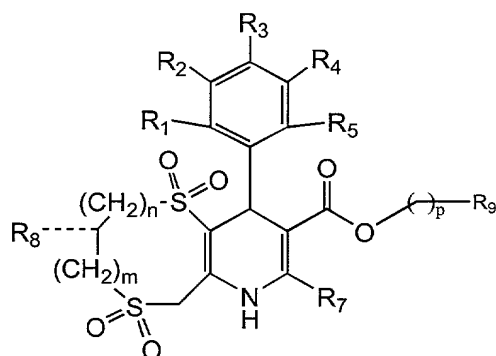
- (c) reacting the compound of Formula 1d with the compounds of Formulae 1e and 1f



to form the compound of Claim 1.

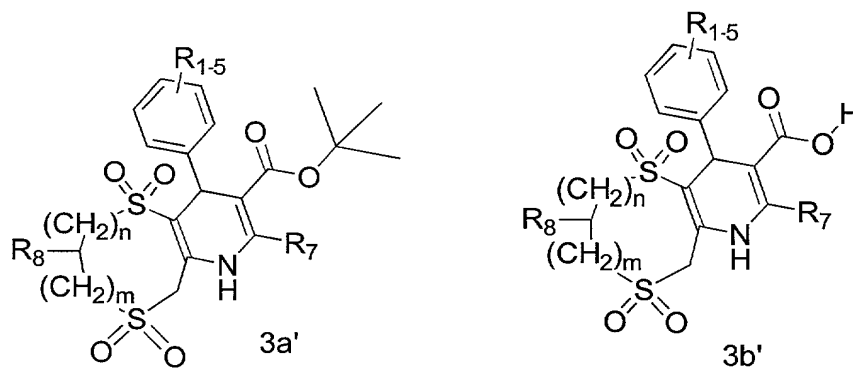
61. The process of Claim 60, wherein  $R_8$  of the compound of Formula I is a methylene group formed from a methylol group using a dehydrating agent.

62. A process of preparing the compound of Claim 43,



which process comprises the steps of

- 5 (a) reacting the compound of Formula 3a' with formic acid to form the compound of Formula 3b'; and



- (b) reacting the compound of Formula 3b with  $R_9Br$  or  $R_9Cl$  to form the compound of Claim 43.

10

63. The process of Claim 62, wherein  $R_7$  is methyl.